==========

Sequence Listing could not be accepted due to errors.
See attached Validation Report.
If you need help call the Patent Electronic Business Center at (866) 217-9197 (toll free).
Reviewer: markspencer
Timestamp: [year=2008; month=10; day=17; hr=7; min=40; sec=41; ms=10;]

==========

****

Reviewer Comments:
<210> 8
<211> 31
<212> DNA
<213> Artifical Sequence

<400> 8

cacgctgtttggcatcgacctgaccatcatg

<210> 9
<211> 31
<212> DNA
<213> Artifical Sequence

<400> 9

Gccacggccacgcggaatgtgatgccgcccc

Please change “Artifical” to “Artificial” in the response for numeric identifier <213>.

For SEQ ID # 8 and 9, when using “Artificial sequence”, for numeric identifier <213>, a mandatory feature is required to explain the source of the genetic material. The feature consists of <220>, which remains blank, and <223>, which states the source of the genetic material. To explain the source, if the sequence is put together from several organisms, please list those organisms. If the sequence is made in the laboratory, please indicate that the sequence is synthesized. Please

make all necessary changes.

For SEQ ID # 8 and 9, the nucleic acid sequence is not in the proper format. Nucleotide bases must be in groups of ten nucleotides. The individual groups of ten nucleotides must be separated by a space. The sequence rules require that “the enumeration of nucleotide bases shall start at the first base of the sequence with 1. The enumeration shall be continuous through the whole sequence in the direction 5’ to 3’. The enumeration shall be marked in the right margin, next to the line containing the one-letter codes for bases, and giving the number of the last base of that line.” Please make all necessary changes.

****

Validated By CRFValidator v 1.0.3

Application No: 10553097 Version No: 1.0

Input Set:

Output Set:

Started: 2008-10-15 14:45:15.073
Finished: 2008-10-15 14:45:15.670
Elapsed: 0 hr(s) 0 min(s) 0 sec(s) 597 ms
Total Warnings: 2
Total Errors: 2
No. of SeqIDs Defined: 9
Actual SeqID Count: 9

Error code		Error Description
W	402	Undefined organism found in <213> in SEQ ID (8)
E	254	The total number of bases conflicts with running total Input: 0, Calculated : 31 SEQID(8)
W	402	Undefined organism found in <213> in SEQ ID (9)
E	254	The total number of bases conflicts with running total Input: 0, Calculated : 31 SEQID(9)

SEQUENCE LISTING

<110> National Renewable Energy Laboratory

<120> OXYGEN RESISTANT HYDROGENASES AND METHODS FOR DESIGNING AND MAKING SAME

<130> NREL 03-11

<140> 10553097
<141> 2008-10-15

<160> 9

<170> PatentIn version 3.4

<210> 1
<211> 333
<212> PRT
<213> Chlamydomonas reinhardtii

<400> 1

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Pro Val Ala Ala Leu Lys Glu Lys Ser His Ile Glu Lys Val Gln Glu
1               5                  10                  15

Ala Leu Asn Asp Pro Lys Lys His Val Ile Val Ala Met Ala Pro Ser
            20                  25                  30

Val Arg Thr Ala Met Gly Glu Leu Phe Lys Met Gly Tyr Gly Lys Asp
        35                  40                  45

Val Thr Gly Lys Leu Tyr Thr Ala Leu Arg Met Leu Gly Phe Asp Lys
    50                  55                  60

Val Phe Asp Ile Asn Phe Gly Ala Asp Met Thr Ile Met Glu Glu Ala
65                  70                  75                  80

Thr Glu Leu Leu Gly Arg Val Lys Asn Asn Gly Pro Phe Pro Met Phe
                85                  90                  95

Thr Ser Cys Cys Pro Ala Trp Val Arg Leu Ala Gln Asn Tyr His Pro
            100                 105                 110

Glu Leu Leu Asp Asn Leu Ser Ser Ala Lys Ser Pro Gln Gln Ile Phe
        115                 120                 125

Gly Thr Ala Ser Lys Thr Tyr Tyr Pro Ser Ile Ser Gly Ile Ala Pro
    130                 135                 140
```

```
Glu Asp Val Tyr Thr Val Thr Ile Met Pro Cys Asn Asp Lys Lys Tyr
145                 150                 155                 160

Glu Ala Asp Ile Pro Phe Met Glu Thr Asn Ser Leu Arg Asp Ile Asp
                165                 170                 175

Ala Ser Leu Thr Thr Arg Glu Leu Ala Lys Met Ile Lys Asp Ala Lys
            180                 185                 190

Ile Lys Phe Ala Asp Leu Glu Asp Gly Glu Val Asp Pro Ala Met Gly
        195                 200                 205

Thr Tyr Ser Gly Ala Gly Ala Ile Phe Gly Ala Thr Gly Gly Val Met
    210                 215                 220

Glu Ala Ala Ile Arg Ser Ala Lys Asp Phe Ala Glu Asn Lys Glu Leu
225                 230                 235                 240

Glu Asn Val Asp Tyr Thr Glu Val Arg Gly Phe Lys Gly Ile Lys Glu
                245                 250                 255

Ala Glu Val Glu Ile Ala Gly Asn Lys Leu Asn Val Ala Val Ile Asn
            260                 265                 270

Gly Ala Ser Asn Phe Phe Glu Phe Met Lys Ser Gly Lys Met Asn Glu
        275                 280                 285

Lys Gln Tyr His Phe Ile Glu Val Met Ala Cys Pro Gly Gly Cys Ile
    290                 295                 300

Asn Gly Gly Gly Gln Pro His Val Asn Ala Leu Asp Arg Glu Asn Val
305                 310                 315                 320

Asp Tyr Arg Lys Leu Arg Ala Ser Val Leu Tyr Asn Gln
                325                 330
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<210> 2
<211> 333
<212> PRT
<213> Chlamydomonas reinhardtii

<400> 2

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Pro Val Ala Ala Leu Ser Glu Lys Ser His Met Asp Arg Val Lys Asn
1               5                  10                  15

Ala Leu Asn Ala Pro Glu Lys His Val Ile Val Ala Met Ala Pro Ser
            20                  25                  30

Val Arg Ala Ser Ile Gly Glu Leu Phe Asn Met Gly Phe Gly Val Asp
        35                  40                  45

Val Thr Gly Lys Ile Tyr Thr Ala Leu Arg Gln Leu Gly Phe Asp Lys
    50                  55                  60

Ile Phe Asp Ile Asn Phe Gly Ala Asp Met Thr Ile Met Glu Glu Ala
65                  70                  75                  80

Thr Glu Leu Val Gln Arg Ile Glu Asn Asn Gly Pro Phe Pro Met Phe
                85                  90                  95

Thr Ser Cys Cys Pro Gly Trp Val Arg Gln Ala Glu Asn Tyr Tyr Pro
            100                 105                 110

Glu Leu Leu Asn Asn Leu Ser Ser Ala Lys Ser Pro Gln Gln Ile Phe
        115                 120                 125

Gly Thr Ala Ser Lys Thr Tyr Tyr Pro Ser Ile Ser Gly Leu Asp Pro
    130                 135                 140

Lys Asn Val Phe Thr Val Thr Val Met Pro Cys Thr Ser Lys Lys Phe
145                 150                 155                 160

Glu Ala Asp Arg Pro Gln Met Glu Lys Asp Gly Leu Arg Asp Ile Asp
                165                 170                 175

Ala Val Ile Thr Thr Arg Glu Leu Ala Lys Met Ile Lys Asp Ala Lys
            180                 185                 190

Ile Pro Phe Ala Lys Leu Glu Asp Ser Glu Ala Asp Pro Ala Met Gly
        195                 200                 205

Glu Tyr Ser Gly Ala Gly Ala Ile Phe Gly Ala Thr Gly Gly Val Met
    210                 215                 220

Glu Ala Ala Leu Arg Ser Ala Lys Asp Phe Ala Glu Asn Ala Glu Leu
```

225 230 235 240

Glu Asp Ile Glu Tyr Lys Gln Val Arg Gly Leu Asn Gly Ile Lys Glu
245 250 255

Ala Glu Val Glu Ile Asn Asn Asn Lys Tyr Asn Val Ala Val Ile Asn
260 265 270

Gly Ala Ser Asn Leu Phe Lys Phe Met Lys Ser Gly Met Ile Asn Glu
275 280 285

Lys Gln Tyr His Phe Ile Glu Val Met Ala Cys His Gly Gly Cys Val
290 295 300

Asn Gly Gly Gly Gln Pro His Val Asn Pro Lys Asp Leu Glu Lys Val
305 310 315 320

Asp Ile Lys Lys Val Arg Ala Ser Val Leu Tyr Asn Gln
325 330

<210> 3
<211> 321
<212> PRT
<213> Chlamydomonas reinhardtii

<400> 3

Pro Glu Asn Ala Ile Tyr Glu Ala Gln Ser Trp Val Pro Glu Val Glu
1 5 10 15

Lys Lys Leu Lys Asp Gly Lys Val Lys Cys Ile Ala Met Pro Ala Pro
20 25 30

Ala Val Arg Tyr Ala Leu Gly Asp Ala Phe Gly Met Pro Val Gly Ser
35 40 45

Val Thr Thr Gly Lys Met Leu Ala Ala Leu Gln Lys Leu Gly Phe Ala
50 55 60

His Cys Trp Asp Thr Glu Phe Thr Ala Asp Val Thr Ile Trp Glu Glu
65 70 75 80

Gly Ser Glu Phe Val Glu Arg Leu Thr Lys Lys Ser Asp Met Pro Leu
85 90 95

```
Pro Gln Phe Thr Ser Cys Cys Pro Gly Trp Gln Lys Tyr Ala Glu Thr
            100                 105                 110

Tyr Tyr Pro Glu Leu Leu Pro His Phe Ser Thr Cys Lys Ser Pro Ile
        115                 120                 125

Gly Met Asn Gly Ala Leu Ala Lys Thr Tyr Gly Ala Glu Arg Met Lys
    130                 135                 140

Tyr Asp Pro Lys Gln Val Tyr Thr Val Ser Ile Met Pro Cys Ile Ala
145                 150                 155                 160

Lys Lys Tyr Glu Gly Leu Arg Pro Glu Leu Lys Ser Ser Gly Met Arg
                165                 170                 175

Asp Ile Asp Ala Thr Leu Thr Thr Arg Glu Leu Ala Tyr Met Ile Lys
            180                 185                 190

Lys Ala Gly Ile Asp Phe Ala Lys Leu Pro Asp Gly Lys Arg Asp Ser
        195                 200                 205

Leu Met Gly Glu Ser Thr Gly Gly Ala Thr Ile Phe Gly Val Thr Gly
    210                 215                 220

Gly Val Met Glu Ala Ala Leu Arg Phe Ala Tyr Glu Ala Val Thr Gly
225                 230                 235                 240

Lys Lys Pro Asp Ser Trp Asp Phe Lys Ala Val Arg Gly Leu Asp Gly
                245                 250                 255

Ile Lys Glu Ala Thr Val Asn Val Gly Gly Thr Asp Val Lys Val Ala
            260                 265                 270

Val Val His Gly Ala Lys Arg Phe Lys Gln Val Cys Asp Asp Val Lys
        275                 280                 285

Ala Gly Lys Ser Pro Tyr His Phe Ile Glu Tyr Met Ala Cys Pro Gly
    290                 295                 300

Gly Cys Val Cys Gly Gly Gly Gln Pro Val Met Pro Gly Val Leu Glu
305                 310                 315                 320
```

Ala

<210> 4
<211> 393
<212> PRT
<213> Chlamydomonas reinhardtii

<400> 4

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Ala Thr Asp Ala Val Pro His Trp Lys Leu Ala Leu Glu Glu Leu Asp
1               5                   10                  15

Lys Pro Lys Asp Gly Gly Arg Lys Val Leu Ile Ala Gln Val Ala Pro
            20                  25                  30

Ala Val Arg Val Ala Ile Ala Glu Ser Phe Gly Leu Ala Pro Gly Ala
        35                  40                  45

Val Ser Pro Gly Lys Leu Ala Ala Gly Leu Arg Ala Leu Gly Phe Asp
    50                  55                  60

Gln Val Phe Asp Thr Leu Phe Ala Ala Asp Leu Thr Ile Met Glu Glu
65                  70                  75                  80

Gly Thr Glu Leu Leu His Arg Leu Lys Glu His Leu Glu Ala His Pro
                85                  90                  95

His Ser Asp Glu Pro Leu Pro Met Phe Thr Ser Cys Cys Pro Gly Trp
            100                 105                 110

Val Ala Met Met Glu Lys Ser Tyr Pro Glu Leu Ile Pro Phe Val Ser
        115                 120                 125

Ser Cys Lys Ser Pro Gln Met Met Met Gly Ala Met Val Lys Thr Tyr
    130                 135                 140

Leu Ser Glu Lys Gln Gly Ile Pro Ala Lys Asp Ile Val Met Val Ser
145                 150                 155                 160

Val Met Pro Cys Val Arg Lys Gln Gly Glu Ala Asp Arg Glu Trp Phe
                165                 170                 175

Cys Val Ser Glu Pro Gly Val Arg Asp Val Asp His Val Ile Thr Thr
            180                 185                 190
```

```
Ala Glu Leu Gly Asn Ile Phe Lys Glu Arg Gly Ile Ile Leu Pro Glu
        195                 200                 205

Leu Pro Asp Ser Asp Trp Asp Gln Pro Leu Gly Leu Gly Ser Gly Ala
    210                 215                 220

Gly Val Leu Phe Gly Thr Thr Gly Gly Val Met Glu Ala Ala Val Arg
225                 230                 235                 240

Thr Ala Tyr Glu Ile Val Thr Lys Glu Pro Leu Pro Arg Leu Asn Leu
                245                 250                 255

Ser Glu Val Arg Gly Leu Asp Gly Ile Lys Glu Ala Ser Val Thr Leu
            260                 265                 270

Val Pro Ala Pro Gly Ser Lys Phe Ala Glu Leu Val Ala Ala Arg Leu
        275                 280                 285

Ala His Lys Val Glu Glu Ala Ala Ala Ala Glu Ala Ala Ala Ala Val
    290                 295                 300

Glu Gly Ala Val Lys Pro Pro Ile Ala Tyr Asp Gly Gly Gln Gly Phe
305                 310                 315                 320

Ser Thr Asp Asp Gly Lys Gly Gly Leu Lys Leu Arg Val Ala Val Ala
                325                 330                 335

Asn Gly Leu Gly Asn Ala Lys Lys Leu Ile Gly Lys Met Val Ser Gly
            340                 345                 350

Glu Ala Lys Tyr Asp Phe Val Glu Ile Met Ala Cys Pro Ala Gly Cys
        355                 360                 365

Val Gly Gly Gly Gly Gln Pro Arg Ser Thr Asp Lys Gln Ile Thr Gln
    370                 375                 380

Lys Arg Gln Ala Ala Leu Tyr Asp Leu
385                 390
```

<210> 5
<211> 386
<212> PRT

<213> Chlamydomonas reinhardtii

<400> 5

```
Ala Glu Ala Pro Leu Ser His Val Gln Gln Ala Leu Ala Glu Leu Ala
1               5                  10                  15

Lys Pro Lys Asp Asp Pro Thr Arg Lys His Val Cys Val Gln Val Ala
            20                  25                  30

Pro Ala Val Arg Val Ala Ile Ala Glu Thr Leu Gly Leu Ala Pro Gly
        35                  40                  45

Ala Thr Thr Pro Lys Gln Leu Ala Glu Gly Leu Arg Arg Leu Gly Phe
    50                  55                  60

Asp Glu Val Phe Asp Thr Leu Phe Gly Ala Asp Leu Thr Ile Met Glu
65                  70                  75                  80

Glu Gly Ser Glu Leu Leu His Arg Leu Thr Glu His Leu Glu Ala His
                85                  90                  95

Pro His Ser Asp Glu Pro Leu Pro Met Phe Thr Ser Cys Cys Pro Gly
            100                 105                 110

Trp Ile Ala Met Leu Glu Lys Ser Tyr Pro Asp Leu Ile Pro Tyr Val
        115                 120                 125

Ser Ser Cys Lys Ser Pro Gln Met Met Leu Ala Ala Met Val Lys Ser
    130                 135                 140

Tyr Leu Ala Glu Lys Lys Gly Ile Ala Pro Lys Asp Met Val Met Val
145                 150                 155                 160

Ser Ile Met Pro Cys Thr Arg Lys Gln Ser Glu Ala Asp Arg Asp Trp
                165                 170                 175

Phe Cys Val Asp Ala Asp Pro Thr Leu Arg Gln Leu Asp His Val Ile
            180                 185                 190

Thr Thr Val Glu Leu Gly Asn Ile Phe Lys Glu Arg Gly Ile Asn Leu
        195                 200                 205

Ala Glu Leu Pro Glu Gly Glu Trp Asp Asn Pro Met Gly Val Gly Ser
```

```
    210                 215                 220

Gly Ala Gly Val Leu Phe Gly Thr Thr Gly Gly Val Met Glu Ala Ala
225                 230                 235                 240

Leu Arg Thr Ala Tyr Glu Leu Phe Thr Gly Thr Pro Leu Pro Arg Leu
                245                 250                 255

Ser Leu Ser Glu Val Arg Gly Met Asp Gly Ile Lys Glu Thr Asn Ile
            260                 265                 270

Thr Met Val Pro Ala Pro Gly Ser Lys Phe Glu Glu Leu Leu Lys His
        275                 280                 285

Arg Ala Ala Ala Arg Ala Glu Ala Ala Ala His Gly Thr Pro Gly Pro
    290                 295                 300

Leu Ala Trp Asp Gly Gly Ala Gly Phe Thr Ser Glu Asp Gly Arg Gly
305                 310                 315                 320

Gly Ile Thr Leu Arg Val Ala Val Ala Asn Gly Leu Gly Asn Ala Lys
                325                 330                 335

Lys Leu Ile Thr Lys Met Gln Ala Gly Glu Ala Lys Tyr Asp Phe Val
            340                 345                 350

Glu Ile Met Ala Cys Pro Ala Gly Cys Val Gly Gly Gly Gly Gln Pro
        355                 360                 365

Arg Ser Thr Asp Lys Ala Ile Thr Gln Lys Arg Gln Ala Ala Leu Tyr
    370                 375                 380

Asn Leu
385
```

<210> 6
<211> 441
<212> PRT
<213> Chlamydomonas reinhardtii

<400> 6

```
Ala Ala Pro Ala Ala Glu Ala Pro Leu Ser His Val Gln Gln Ala Leu
1               5                   10                  15
```

```
Ala Glu Leu Ala Lys Pro Lys Asp Asp Pro Thr Arg Lys His Val Cys
            20                  25                  30

Val Gln Val Ala Pro Ala Val Arg Val Ala Ile Ala Glu Thr Leu Gly
        35                  40                  45

Leu Ala Pro Gly Ala Thr Thr Pro Lys Gln Leu Ala Glu Gly Leu Arg
    50                  55                  60

Arg Leu Gly Phe Asp Glu Val Phe Asp Thr Leu Phe Gly Ala Asp Leu
65                  70                  75                  80

Thr Ile Met Glu Glu Gly Ser Glu Leu Leu His Arg Leu Thr Glu His
                85                  90                  95

Leu Glu Ala His Pro His Ser Asp Glu Pro Leu Pro Met Phe Thr Ser
            100                 105                 110

Cys Cys Pro Gly Trp Ile Ala Met Leu Glu Lys Ser Tyr Pro Asp Leu
        115                 120                 125

Ile Pro Tyr Val Ser Ser Cys Lys Ser Pro Gln Met Met Leu Ala Ala
    130                 135                 140

Met Val Lys Ser Tyr Leu Ala Glu Lys Lys Gly Ile Ala Pro Lys Asp
145                 150                 155                 160

Met Val Met Val Ser Ile Met Pro Cys Thr Arg Lys Gln Ser Glu Ala
                165                 170                 175

Asp Arg Asp Trp Phe Cys Val Asp Ala Asp Pro Thr Leu Arg Gln Leu
            180                 185                 190

Asp His Val Ile Thr Thr Val Glu Leu Gly Asn Ile Phe Lys Glu Arg
        195                 200                 205

Gly Ile Asn Leu Ala Glu Leu Pro Glu Gly Glu Trp Asp Asn Pro Met
    210                 215                 220
```